

CLAIMS

1. An oxynitride thermoelectric material, which has an element composition represented by the following formula (A):



wherein M represents a transition element; R represents a rare earth element; $0 \leq z \leq 0.7$, $0 \leq y \leq 0.7$, $0.2 \leq x \leq 1.0$, $0 \leq u \leq 0.7$, $0 \leq v \leq 0.05$, $0.9 \leq s+t \leq 1.7$, and $0.4 \leq s \leq 1.2$; and $x+y+z = 1$, and

has an absolute value of a Seebeck coefficient of $40 \mu\text{V/K}$ or more at a temperature of 100°C or more.

2. The oxynitride thermoelectric material according to claim 1, wherein the element composition has an electrical resistivity of $10^{-3} \Omega\text{cm}$ or less.

3. The oxynitride thermoelectric material according to claim 1 or 2, wherein M in formula (A) is at least one transition element selected from Ni, Fe, Co and Mn.

4. The oxynitride thermoelectric material according to claim 1 or 2, wherein R in formula (A) is at least one rare earth element selected from Gd, Sc, Sm, Tb and Dy.

5. The oxynitride thermoelectric material according to any one of claims 1 to 4, which comprises at least one having an amorphous structure.

6. A nitride thermoelectric material which has an element composition represented by formula (B):



wherein M represents a transition element; R represents a rare earth element; D represents at least one element selected from elements of the Group IV or II; $0 \leq z \leq 0.7$, $0 \leq y \leq 0.7$, $0.2 \leq x \leq 1.0$, $0 \leq u \leq 0.7$, $0 \leq v \leq 0.05$, $0 \leq w \leq 0.2$, and $0.9 \leq m \leq 1.1$; and $x+y+z = 1$, and

has an absolute value of a Seebeck coefficient of $50 \mu\text{V/K}$ or more at a temperature of 100°C or more, and an electrical resistivity of $10^{-3} \Omega\text{cm}$ or less.

7. The nitride thermoelectric material according to claim 6, wherein M in formula (B) is at least transition element selected from Ni, Fe, Co and Mn.

8. The nitride thermoelectric material according to claim 6, wherein R in formula (B) is at least rare earth element selected from Gd, Sc, Sm and Tb.

9. The nitride thermoelectric material according to claim 6, wherein D in formula (B) is at least one element selected from Ge, Si, Mg and Zn.

10. The nitride thermoelectric material according to any one of claims 6 to 9, which comprises at least one having a wurtzite crystal structure.

11. The nitride thermoelectric material according to any one of claims 6 to 9, which comprises at least one having an amorphous structure.